Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A method for adaptively equalizing a multi-gigabit analog information signal for a signal path, comprising the steps of:

(1) sampling a multi-gigabit analog information signal, thereby generating analog samples;

(2) performing an equalizing process on the analog samples; and

(3) quantizing the equalized samples of the multi-gigabit analog information signal.

2. (original) The method according to claim 1, wherein step (2) comprises the steps of:

(a) comparing a multi-level representation of the equalized samples with the quantized equalized samples;

(b) performing a least-means-squared operation on results of the comparison;

(c) adjusting an equalization coefficient with a result of the least-means-squared operation; and

(d) repeating steps (2)(a) through (2)(c).

3. (currently amended) The method according to claim ~~(2)~~ 2, wherein steps (2)(a) through (2)(d) are performed at a sub-sample rate relative to the sampling of step (1).

4. (currently amended) The method according to claim ~~(2)~~ 2, wherein steps (2)(a) through (2)(d) are performed at ~~a~~ an off-set of a sub-sample rate relative to the sampling of step (1).

5. (original) The method according to claim 1, wherein step (2) comprises the steps of minimizing differences between post-transition sample amplitudes and steady state sample amplitudes of the samples.

6. (original) The method according to claim 5, wherein step (2) comprises the steps of:

(a) distinguishing between post-transition samples and steady-state samples;

(b) integrating post-transition sample amplitudes;

(c) integrating steady-state sample amplitudes;

(d) determining a difference between the integrated post-transition sample amplitudes and the integrated steady-state sample amplitudes;

(e) adjusting an equalization coefficient to minimize the differences between the integrated post-transition sample amplitudes and the integrated steady-state sample amplitudes; and

(f) repeating steps (2)(a) through (2)(e).

7. (currently amended) The method according to claim ~~(6)~~ 6, wherein steps (2)(a) through (2)(f) are performed at a sub-sample rate relative to the sampling of step (1).

8. (currently amended) The method according to claim ~~(6)~~ 6, wherein steps (2)(a) through (2)(f) are performed at ~~a~~ an off-set of a sub-sample rate relative to the sampling of step (1).

9. (original) The method according to claim 5, wherein step (2) comprises the steps of:

(a) distinguishing between post-transition samples and steady-state samples;

(b) averaging post-transition sample amplitudes;

(c) averaging steady-state sample amplitudes;

(d) determining a difference between the averaged post-transition sample amplitudes and the averaged steady-state sample amplitudes;

(e) adjusting an equalization coefficient to minimize the differences between the integrated post-transition sample amplitudes and the integrated steady-state sample amplitudes; and

(f) repeating steps (2)(a) through (2)(e).

10. (original) The method according to claim 5, wherein step (2) comprises the steps of:

(a) distinguishing between post-transition samples and steady-state samples;

(b) accumulating post-transition sample amplitudes;

(c) accumulating steady-state sample amplitudes;

(d) determining a difference between the accumulated post-transition sample amplitudes and the accumulated steady-state sample amplitudes;

(e) adjusting an equalization coefficient to minimize the differences between the integrated post-transition sample amplitudes and the integrated steady-state sample amplitudes; and

(f) repeating steps (2)(a) through (2)(e).

11. (original) The method according to claim 1, wherein step (2) comprises the step of minimizing inter-symbol interferences in the samples.

12. (cancelled) The method according to claim 1, wherein step (2) comprises the step of minimizing the inter-symbol interferences in the samples.

13. (currently amended) A method <u>for</u> adaptively equalizing time staggered portions of a multi-gigabit analog information signal for a signal path, comprising the steps of:

(1) sampling the multi-gigabit analog information signal at a plurality of phases;

(2) measuring an equalization quality of the samples from one of the plurality of phases;

(3) equalizing the samples from each of the phases based on the measured equalization quality of the one phase; and

~~(3)~~ (4) quantizing the equalized samples.

14. (currently amended) A method for adaptively equalizing ~~a~~ time staggered portions of a plurality of multi-gigabit analog information signals for respective signal paths, comprising the steps of:

(1) generating clock signals from the plurality multi-gigabit analog information signals;

(2) sampling each of the multi-gigabit analog information signals at a plurality of phases of the respective clock signals;

(3) measuring an equalization quality of the samples from one of the plurality of phases for each of the multi-gigabit analog information signals;

(4) equalizing the samples from each of the phases of each of the multi-gigabit analog information signals based on the measured equalization quality of the one phase of each of the respective multi-gigabit analog information signals; and

(5) quantizing the equalized samples.

15. (currently amended) A method for adaptively equalizing a plurality of multi-gigabit analog information signals for respective signal paths, comprising the steps of:

(1) generating a clock signal for each of the multi-gigabit analog information signals from each of the respective multi-gigabit analog information signals;

(2) sampling each of the multi-gigabit analog information signals according to the respective clock signals;

(3) performing an equalizing process on the samples; and

~~(5)~~ (4) quantizing the equalized samples.

16. (original) A system for quantizing a multi-gigabit serial analog information signal, comprising:

a sampler;

an equalizer coupled to said sampler; and

a quantizer coupled to said equalizer;

wherein said equalizer minimizes inter-symbol interferences in samples output from said sampler and said quantizer quantizes equalized samples output from said equalizer.

17. (currently amended) The system according to claim 16, wherein said equalizer comprises ~~an~~ <u>a</u> finite impulse response ("FIR") having at least one adjustable tap, said system further comprising control logic coupled to said FIR, wherein said control logic generates tap updates for said FIR.

18. (original) The system according to claim 17, wherein said control logic comprises:

a first input coupled to an output of said equalizer;

an analog-to-digital converter ("ADC") coupled to said first input; and

a control module coupled to an output of said ADC;

wherein said ADC generates multi-level representations of equalized samples, and said control module generates tap updates from at least said multi-level representations of the equalized samples.

19. (currently amended) The system according to claim 17, wherein ~~s-aid~~ <u>said</u> control logic comprises:

a second input coupled to an output of said quantizer; and

a least-means-squared ("LMS") module coupled to said first and second control logic inputs;

wherein said LMS module compares the multi-level representations of equalized samples with the quantized samples from said quantizer and generates said tap updates according to the comparison.

20. (original) The system according to claim 17, wherein said control logic comprises:

a difference detector having a steady-state path, a post-transition path, and a combiner; and

a state machine coupled to one or more outputs of said difference detector;

wherein said combiner outputs an average difference between post-transition amplitudes of the equalized samples and steady-state amplitudes of the equalized samples, wherein said state machine generates said tap updates according to said average difference.

21. (currently amended) A system for routing and adaptively equalizing high data rate analog data signals, comprising:

a backplane having a plurality of signal paths; and

at least one interface board coupled to said backplane, said interface board including a plurality of receivers coupled to said backplane signal paths, each said receiver including an adaptive equalizer;

wherein each said equalizer adapts to an associated backplane signal path to equalize an analog data signal ~~receiver~~ received from said associated backplane signal path.